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OCCURRENCE OF EASTERN DWARF MISTLETOE ON BLACK SPRUCE IN THE UPPER PENINSULA OF MICHIGAN

by

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INTRODUCTION

Eastern dwarf mistletoe, *Arceuthobium pusillum* Peck is the most serious disease of black spruce in the Upper Peninsula of Michigan. In 1949, Ralph Anderson, North Central Forest Experiment Station, estimated 10 percent of 2.2 million acres of black spruce stands were infected. This survey of the Upper Peninsula was initiated to revise the 1949 estimate, determine the distribution and establish the occurrence of the disease in commercial and non-commercial stands.

METHODS

Four hundred and twenty-three randomly selected black spruce stands were examined during August 1976. The presence or absence of eastern dwarf mistletoe, an estimate of the percentage of stems infected (1-25, 26-50, or 51-100%), merchantability, and geographic location was recorded for each stand. Commercial forest land is defined as land producing or capable of producing crops of industrial wood.

All stands were plotted on a small scale map for pattern recognition analysis. The survey area was divided into four classifications: no black spruce, black spruce but no mistletoe, 50 percent or less of the stands infected, and over 50 percent of the stands infected.

RESULTS

Seventeen percent of the 423 black spruce stands examined were infected with the eastern dwarf mistletoe. We judged that 80 percent of the stands had the potential of becoming merchantable. Sixteen percent of these commercial stands were infected, while 18 percent of the non-commercial stands were infected. Thirteen percent of all stands were classified as having between 1-25 percent of the stems infected, 3 percent as between 26-50 percent, and 2 percent as over 51 percent of the stem infected (Table 1).

This survey shows that 17 percent of the black spruce stands in the Upper Peninsula are infected with eastern dwarf mistletoe and that the infection occurs in identifiable patterns. Infection is about equally distributed in merchantable and non-merchantable stands. The disease is concentrated in heavily infected zones bordered by lightly infected or uninfected zones. Heavy infection was limited to about 5 percent of the land. This condition may be the result of previous fire exclusion (fire being a natural control of eastern dwart mistletoe). The disease can be spread a long distance by birds and locally by natural seed release (up to 50 feet). Without dwarf mistletoe control, infection zones will undoubtedly continue to enlarge and increased mortality of black spruce can be expected as a result.

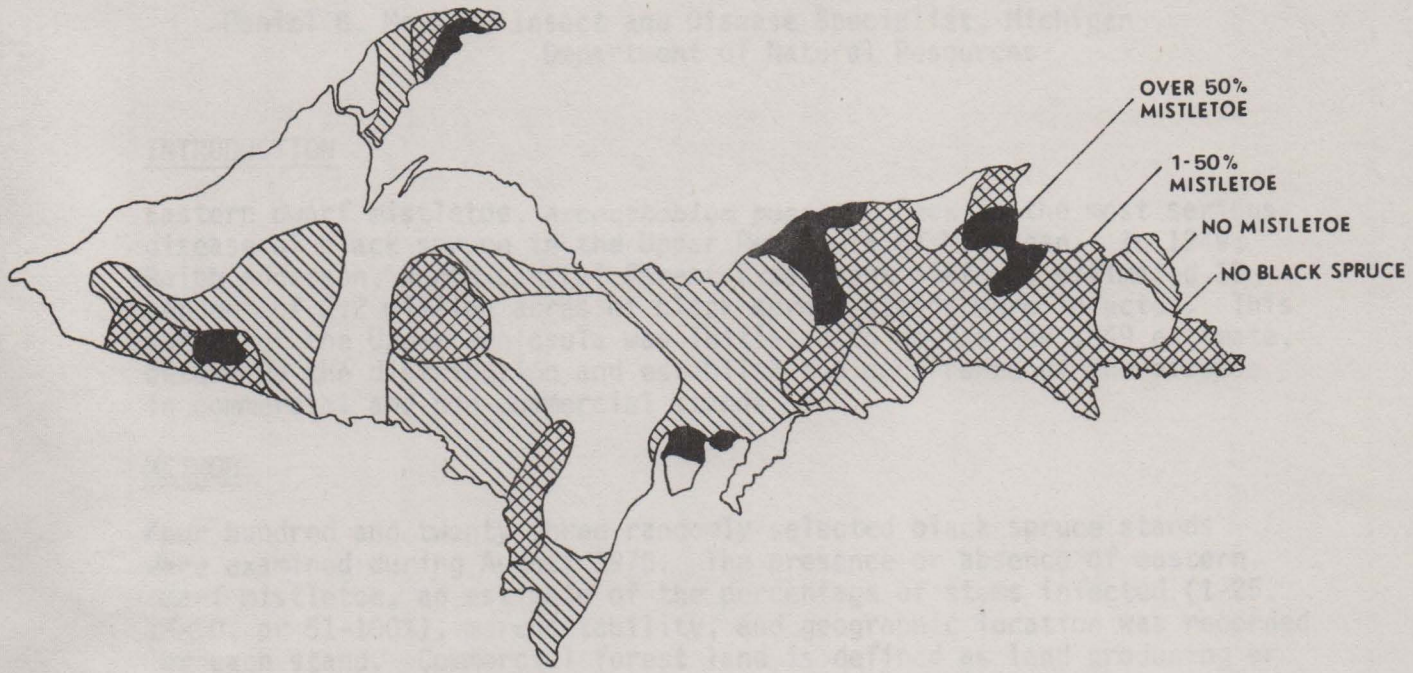
Eastern dwarf mistletoe control should be considered during black spruce harvest operations. Preliminary guidelines for control can be found in: William Johnson's Black Spruce Management Guide, NCFES, (In Press).

Table 1. Classification of infection in merchantable and non-merchantable black spruce stands in the Upper Peninsula of Michigan (In percent).

Site Potential	Not Infected	Percent of Stems/Stand Infected		
		1-25	26-50	51-100
Commercial[1/]	83.8	12.3	2.5	1.4
Non-commercial	81.7	12.8	3.3	2.2

1/ Commercial Forest Land - Forest land producing or capable of producing crops of industrial wood.

MICHIGAN -- UPPER PENINSULA



Zones of eastern dwarf mistletoe infection on black spruce in the Upper Peninsula of Michigan.